



## AMERICAN FOUNDRY SOCIETY

publisher of **MODERN CASTING & Engineered Casting Solutions**

1695 N. Penny Lane ▼ Schaumburg, IL 60173

800/537-4237 ▼ 847/824-0181

Fax: 847/824-7848 ▼ Website: [www.afsinc.org](http://www.afsinc.org)

### President

P.H. Mikkola  
Retired

Metal Casting Technology Inc.

### Vice President

S.H. Reynolds  
Lufkin Industries, Inc.

### Second Vice President

H.W. Lodge  
Lodge Manufacturing Company

### Immediate Past President

A.T. Lucchetti  
Cumberland Foundry Co., Inc.

### Executive Vice President

J. Call

### Regional Vice Presidents

W. Chaput

OmniSource Corp.

T.G. McMillin

Fairmont Minerals Ltd.

C. Norch

Denison Industries

M.L. Selz

Charlotte Pipe & Foundry Co.

S.A. Soares

Porter Warner Industries, LLC

B.A. Voisine

Allied Mineral Products, Inc.

### Directors

D.J. Backens

John Deere Foundry

R.J. Boose

Boose Aluminum Foundry Co., Inc.

T. Brown

Benton Foundry

2. Cooper

Ashland, Inc.

B.W. Dienst

Simpson Technologies Corporation

W.W. Doebler

Williamsport Foundry Co., Inc.

D. Dotson

The Dotson Company, Inc.

J.E. Farrar

Farrar Corporation

G.H. Gardner

Retired-ACIPCO

J.M. Gartland Jr.

Atlas Foundry Company, Inc.

M. Krysiak

Sand Technology Co.

C. Merritt

Rypac Aluminum Recycling

M.J. Mullikin

Castalloy, Inc.

M.W. Regus

Pacific Alloy Castings, Co., Inc.

A.K. Steffe

Retired-General Motors

T. Trudeau-Ebenhoeh

Grede Foundries, Inc.

September 12, 2008

Mr. Chad A. Stobbe  
Land Quality Bureau  
Iowa Department of Natural Resources  
502 East 9th Street, Wallace State Office Building  
Des Moines, Iowa 50319-0034

Re: Proposed Amendments to Iowa Administrative Code 567, Chapter 108  
Beneficial Use Determinations: Solid By-Products as Resources and  
Alternative Cover Material

Dear Mr. Stobbe:

On behalf of the American Foundry Society (AFS), I hereby submit these comments on the Department of Natural Resources' (DNR) proposed amendments to Iowa Administrative Code 567, Chapter 108, entitled, *Beneficial Use Determinations: Solid By-Products as Resources and Alternative Cover Material*.

We appreciate this opportunity to provide these comments on the proposed amendments. If you have any questions or would like additional information about the comments, please contact Christian Richter or Jeff Hannapel with our AFS Washington office at 202-457-0630 or [crichter@thepolicygroup.com](mailto:crichter@thepolicygroup.com) or [jhannapel@thepolicygroup.com](mailto:jhannapel@thepolicygroup.com).

Respectfully submitted,

Jerry Call  
Executive Vice President



**The American Foundry Society**  
**Comments on Proposed Amendments to**  
**Iowa Administrative Code 567, Chapter 108**  
**September 12, 2008**

The American Foundry Society (AFS) hereby submits these comments on the Department of Natural Resources' (DNR) proposed amendments to Iowa Administrative Code 567, Chapter 108, entitled, *Beneficial Use Determinations: Solid By-Products as Resources and Alternative Cover Material*. AFS requests that DNR finalize the proposed beneficial use determination amendments pursuant to the comments provided below.

**I. INDUSTRY OVERVIEW**

AFS is the major trade and technical association for the North American metalcasting industry. AFS has more than 9,000 members representing over 3,000 metalcasting firms, their suppliers and customers.

The organization exists to provide knowledge and services that strengthen the metalcasting industry for the ultimate benefit of its customers and society. AFS seeks to advance the sciences related to the manufacture and utilization of metal casting through research, education and dissemination of technology. AFS also provides leadership in government relations, marketing, management and human resources for the metal casting industry.

The practice of melting and casting metal into solid forms has served society's needs for more than 5,000 years. Metal castings are the foundation for all other manufacturing, and metalcasters have been a vital building block for every nation's economic wealth. Every sector relies on castings, 90 percent of all manufactured goods and capital equipment incorporate engineered castings into their makeup. The major industries supplied by metalcasting include agriculture, construction, mining, railroad, automotive, aerospace, communications, health care, defense and national security.



The American metalcasting industry provides employment for over 200,000 men and women directly and supports thousands of other jobs indirectly. The industry supports a payroll of more than \$8 billion and sales of more than \$36 billion annually. Metalcasting plants are found in every state, and the industry is made up of predominately small businesses. Approximately 80 percent of domestic metalcasters have fewer than 100 employees.

In Iowa, AFS represents approximately 40 metalcasting facilities, supports two state chapters with nearly 200 members and has a student chapter at the University of Northern Iowa. These facilities produce foundry sand as a by-product of the metalcasting process and continue to seek opportunities to beneficially reuse it in an environmentally sound manner.

## **II. INTRODUCTION**

These comments prepared by the American Foundry Society (AFS) 10-F Committee on Water and Waste Disposal present the issues and recommendations of our membership in providing environmentally sound, technically achievable and economically justifiable beneficial reuse opportunities for foundry sand, which is a by-product of the metal casting process. These comments identify the critical issues, summarize the industry's position on the issues, and provide supporting data and evidence for our position.

## **III. REGULATION SHOULD NOT BE A BARRIER TO BENEFICIAL REUSE**

**The new rule should not impose requirements that are technically impractical given the nature of foundry sand relative to non-regulated materials such as soil.**

One of the challenges associated with development of beneficial use requirements is to develop standards that do not impose impractical restrictions on the material to be reused. The best way to meet this challenge is to apply the proposed standard to materials that are typically unregulated (such as soil). If the standard precludes the use of an unregulated material, then the standard is too restrictive and should be modified. The key here is to have a proper frame of reference when judging the technical practicality of the proposed standard.

There is new research discussed below that demonstrates that foundry sands generated by iron, steel and aluminum foundries have chemical characteristics that are very similar to common soil materials. In fact, the composition of typical foundry sand (i.e., green sand) is silica sand, bentonite clay, sea coal (i.e., ground bituminous coal), wood flour and water which are all common natural raw materials. The Pennsylvania Transportation Institute of the Pennsylvania State University conducted research on the use of foundry sand in controlled low strength material (CLSM) and hot-mix asphalt. The results of this research are summarized in a report entitled, *Excess Foundry Sand Characterization and Experimental Investigation in Controlled Low-Strength Material and Hot-Mixing Asphalt*.

One of the key aspects of their research involved the comparison of the chemical characteristics of foundry sand with those of natural soils. In their report the Penn State researchers collected existing foundry sand characterization data from 180 foundries across the US. They concluded that, **“Excess foundry sand does not pose a greater threat to the environment than soil.** The concentrations of most regulated metallic elements are less than or in the same level as those of soil.” (Emphasis added). It is critical that these proposed standards not be so restrictive that common soil materials would not meet the requirements for reuse.

#### **IV. DATA DEMONSTRATE THAT FOUNDRY SANDS ARE SAFE**

**The new rule should recognize the wealth of scientific research that indicates that using foundry sand as a soil additive and/or soil amendment is environmentally sound.**

Foremost among our issues is the need for the new beneficial reuse rule to incorporate the tremendous amount of scientific evidence which indicates that spent, non-toxic foundry sand can be safely used in horticultural and agricultural applications. Dr. Robert Dungan and Dr Rufus Chaney of the USDA Agricultural Research Service (ARS) have recently completed a comprehensive research effort evaluating the feasibility of using foundry sand in horticultural applications (e.g., topsoil, potting soil, etc.). Their research, which started in 2002, has been conducted in cooperation with The Ohio State University, The Pennsylvania State University, and Purdue University.



This research effort has performed extensive scientific experiments to assess the fate and transport of trace contaminants, and the human health and ecological risks posed by those contaminants when using foundry sand as an additive or amendment in manufactured topsoil. To date these scientific experiments have revealed that foundry sand can serve as a valuable resource in these applications with little or no evidence of environmental concern. Furthermore, this research has confirmed that the contaminants in foundry sand are present in concentrations that are typically lower than those concentrations found in native soils across the United States.

The research also assessed the potential migration of contaminants present in manufactured topsoil produced with foundry sand. Dr. Richard Stenhower, Associate Professor, Environmental Soil Science, The Penn State University, College of Agricultural Sciences, concludes in his study, *Use of Spent Foundry Sand in Manufactured Topsoils: Assessment of Transport and Availability of Trace Metal and Organic Contaminations and Nutrient Dynamics in the Topsoil Environment*, that “[t]he results of this greenhouse column experiment with spent foundry sand and compost based manufactured soils indicates **no potential environmental concerns with such uses of these types of SFS (spent foundry sands).**” (Emphasis added.)

Additionally, in Dr. Dungan’s unpublished manuscript associated with the USDA-ARS research, *Assessing the Ecotoxicity of Waste Foundry Sands*, he states that “[o]ur study showed that waste sands from the iron, aluminum, and steel foundries did not pose an ecotoxicological or metal transfer risk. Higher organisms, such as earthworm predators, should not be at risk from ingesting earthworms that inhabit soils manufactured from these waste sands.”

In a similar publication, *Assessment of Food-Chain Risk from GM Powertrain Exempt Spent Foundry Sand (SFS) Used in Blended Topsoil*, Terry J. Logan, Ph.D. and Billie J. Lindsay conclude that:

The plant uptake data provide convincing evidence that there is no risk to the food-chain from the use of SFS as a topsoil blend. In all cases, total trace element concentrations were lower than in native soil or other by-product materials such as yard waste compost, manure compost, alkaline stabilized EQ biosolids, and

alum sludge. .... Based on these results, there is no scientific basis for including GM Powertrain exempt SFS in Ohio EPA's Policy restricting the use SFS in topsoil blending because of the potential for food-chain contamination from trace element uptake by crops.

Total concentrations of trace elements in GM Powertrain exempt SFS are considerably lower than USEPA and Ohio EPA regulatory limits for soils, based on soil ingestion. There is a considerable safety factor with respect to risk from direct ingestion. Therefore, it can be concluded that human exposure to trace elements from SFS in blended topsoil from direct ingestion is well within accepted safety margins.

Finally, the U.S Environmental Protection Agency (EPA) is currently conducting its own risk assessment associated with using manufactured topsoil (e.g., 50 percent foundry sand and 50 percent soil) in a residential setting. EPA is evaluating two exposure pathways: soil ingestion and ingestion of vegetables grown in raised vegetable beds. Although the research will not be published until later in Fall 2008, Dr. Peter Grevatt, EPA Office of Solid Waste, presented the following conclusions from the Agency's risk assessment: "[i]f spent foundry sands are properly managed, non-olivine sands from aluminum, iron and steel foundries are safe for beneficial reuses, including manufactured soils in residential settings." If foundry sands are safe for use in manufactured soils in residential settings, they would be safe for many other applications in the State of Iowa.

AFS have been working with EPA and other federal agencies on programs to increase the safe beneficial use of foundry sands. Recently, the metalcasting industry has begun a multi-stakeholder approach that the metalcasting industry has begun with EPA, other federal agencies, the states, end-users of foundry sand, and other stakeholders to increase the amount of foundry sand that is beneficially reused.

It is imperative that the proposed rules do not force individual foundries to put forward the research efforts and paperwork described above to beneficially reuse foundry sand in this manner. The State of Iowa should acknowledge and recognize the overwhelming data that indicates that foundry sand can be used in soil blending, soil amendments, and horticultural applications without fear of environmental harm. Foundry sands that meet these performance criteria should be allowed for these applications without significant regulatory barriers. Such a



result is consistent with the goals and objectives of the multi-stakeholder approach designed to facilitate the beneficial reuse of foundry sand.

## **V. TESTING PROTOCOLS SHOULD BE REVISED FOR FOUNDRY SAND**

**The proposed rule should be more specific about the parameters to be included in an SPLP analysis and eliminate the requirement to run a TCLP for every parameter in Appendix VIII of 40 CFR 261 as well as the need to evaluate whether the solid by-product has any hazardous or toxic constituents at levels exceeding those found in the material it is replacing.**

With the tremendous amount of data available, the reasoning for elimination of these parameters is more compelling today than it was nearly ten years ago. The data in the USDA-ARS study and the other research conducted to date should be sufficient to eliminate much of the need for testing foundry sands intended for most beneficial reuse applications.

## **VI. USE OF FOUNDRY SAND AS DAILY COVER IN LANDFILLS**

**The proposed rule should not prohibit reuse of foundry sand as a beneficial cover material at solid waste landfills.**

Daily cover material at sanitary landfills is used to cover the working face of the landfill and control fire hazards, blowing litter, odors, and vectors. The use of solid by-products such as foundry sand is a good option for sanitary landfills and has been widely used as a source of daily cover material across the country.

Foundry sand is used as a substitute for soil materials in daily cover because it mimics the characteristics of common soil materials. The granular nature of the material provides effective cover of the active working face of the sanitary landfill. It can be spread over the working face easily and also minimizes dusting because of its granular structure.



Foundry sand also possesses excellent refractory properties because it must withstand the intense heat of molten metal during the pouring operations at the foundry. These same refractory properties make it suitable for the control of fire hazards at sanitary landfills. Foundry sand is also odorless, non-putrescible, and does not attract nor support biological vectors.

Requiring a beneficial use determination application per IAC 108.7 is unnecessary and burdensome for companies when foundry sand universally meets the performance criteria included within that standard. The beneficial use of foundry sand as alternate daily cover has been clearly demonstrated in the State of Iowa and should be preapproved.

Foundry sand serves as a gritty substitute for native gravel and stone. It makes good environmental and economic sense to use spent foundry sand rather than virgin soils and aggregate because it conserves natural resources for final cover. The use of foundry sand may also save fuel and lowers costs for landfill construction.

To regulate the use of foundry sand under landfill permit conditions will reduce reuse opportunities and act as a regulatory barrier because it limits the sanitary landfill operator's options for beneficial reuse until permit amendments can be approved through an unnecessary administrative process.

## **VII. CONCLUSION**

AFS appreciates the opportunity to submit these comments on the proposed amendments to the state's beneficial use determinations regulations. AFS continues to support environmentally sound, technically achievable and economically justifiable beneficial reuse opportunities for foundry sand in Iowa and requests that DNR revise its beneficial reuse determination regulations to facilitate these applications.

If you have any questions or would like additional information about the comments, please contact Christian Richter or Jeff Hannapel with our AFS Washington office at 202-457-0630 or [crichter@thepolicygroup.com](mailto:crichter@thepolicygroup.com) or [jhannapel@thepolicygroup.com](mailto:jhannapel@thepolicygroup.com).

